

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[FOURTH SERIES.]

No. 76. APRIL 1874.

XXXIV.—*On the Annelida of the Gulf of St. Lawrence, Canada.* By W. C. M'INTOSH.

Family 1. EUPHROSYNIDÆ, to Family 6. SIGALIONIDÆ.

[Plates IX. & X.]

THE following remarks are due to collections made by Mr. J. F. Whiteaves of Montreal during three dredging-expeditions (1871, 1872*, and 1873) in the Gulf of St. Lawrence; and I am much indebted to him for his courtesy in forwarding the specimens for examination.

No example of the first two families, viz. the Euphrosynidæ and Amphinomidæ, occurs. The Aphroditidæ are represented by several young examples of *Aphrodita aculeata*, L., which are of a somewhat ferruginous hue, like some Zetlandic specimens. The ventral bristles of these young forms resemble those of *A. alta*, Kinberg. One or two examples of *Lætmonice filicornis*, Kbg., a species very abundant in certain parts of the British seas, are also present†. The Polynoidæ are more numerous, and the majority of comparatively large size. *Lepidonotus squamatus*, L., is abundant; and the same may

* *Vide* Ann. Nat. Hist. 4th ser. vol. x. p. 341, 1872. Also 'Report on a second Deep-sea Dredging,' &c., by J. F. Whiteaves, Montreal, 14th January, 1873, pp. 22.

† Prof. Verrill mentions "*Hermione hystrix* (?)" from the coast of New England, but not this form. Americ. Journ. Sci. & Arts, vol. v. Feb. 1873.

be said of *Nychia cirrosa*, Pall. The specimens of the latter have somewhat rougher scales, and a tendency to a longer and more slender tip in the ventral bristles than the British forms. The latter feature is carried to a characteristic degree in *Nychia Amondsoni*, Mgrn., a northern species (not yet discovered in British waters) rather plentiful in the collections. In this form the head differs from that of *N. cirrosa* chiefly in the smaller size of the eyes, especially the posterior pair. The dorsal cirri are longer; but the dorsal bristles are similar, except, perhaps, that the contrast between the shortest and the most elongated is better marked. The ventral bristles are much more attenuated at the tips throughout; and the smooth portion, while little longer in the superior series (though, of course, much more slender), becomes remarkably elongated in the central and lower groups. A specimen of *Selenium poly-noës*, Kröyer, was attached to the ventral aspect of a foot.

Eunoa Erstedii, Mgrn.,

occurred on Orphan Bank, and is distinguished roughly from the more common *E. nodosa*, Sars, likewise in the collection, by the brighter brownish coloration in spirit, by the much rougher scales, and the greater length of the dorsal bristles. Malmgren's figures are much in need of amendment, especially his representation of the dorsal bristles.

Lagisca rarispina, Sars, var. *occidentalis* *.

At first sight, and with an imperfect specimen without scales, the form was considered closely allied to *Polynoë floccosa*, Sav.; but further examination of more perfect examples showed the true character of the annelid. The scales are distinguished by the remarkably long, brownish, soft papillæ posteriorly, and have many parasitic *Loxosomæ* and other structures. The cilia on the dorsal cirri are much less numerous and shorter than on the species from the 'Porcupine' (*Lagisca Jeffreysii*); and the ventral cirri have a few short papillæ: the latter are stated by Malmgren to be subglabrous. The dorsal bristles (Pl. IX. fig. 1) are rather long, tapered towards the point, and with somewhat fine rows of spikes. The smooth part at the tip is of moderate length; but it often seems longer than it really is, since the rows of spikes pass far up; in certain views it is also slightly dilated, so as to give a character to the bristles. The superior ventral bristles

* The generic names in this paper are merely provisional, as very considerable changes will be necessary throughout the whole series of the Annelida in this respect.

(Pl. IX. fig. 2) have elongated tips with a trace of a secondary process; and the spiniferous region is long. The smooth tip becomes more boldly marked inferiorly (Pl. IX. fig. 3); but the secondary process is always a mere rudiment, except, perhaps, in some of the young bristles inferiorly, or in those specially protected (*e. g.* Pl. IX. fig. 4). The general characters of the form agree with *L. rarispina*; but the bristles differ considerably from Malmgren's representations. The young forms do not show the cilia on the ventral cirri—an absence which may have been due occasionally to position; but the want of the characteristic elongated processes on the scales of such is peculiar.

*Malmgrenia Whiteavesii**, n. sp.

A single small specimen about $\frac{1}{4}$ inch long occurred between Anticosti and the Gaspé peninsula in 110 to 221 fathoms. The segments are about twenty in number, and the feet deeply cut; scales absent. The head is apparently eyeless. Antennæ, palpi, and cirri smooth and much tapered. The dorsal cirri do not extend beyond the tips of the bristles; the ventral reach the bases of the latter. The dorsal branch of the foot bears a series of rather slender, elongated, translucent bristles with fine serrations and a characteristic tip (Pl. IX. fig. 5); a few next the body are short and more boldly serrated. The ventral form two sets,—a superior and larger group of delicate elongated bristles with tapering tips, minutely bifid at the extremity (Pl. IX. fig. 6); the tips gradually diminish towards the inferior border of the series, the whole, however, being bifid. At the ventral edge another, small group of stouter bristles exists, the number being variable, generally from six to eight: the enlarged tips of these are serrated for the lower half; then the smooth tip diminishes to a hooked point (Pl. IX. fig. 7).

Antinoë Sarsi, Kinb.

This species is not uncommon in the gulf. The scales have cilia on their posterior and outer borders, and small conical spines. The much elongated and tapered dorsal cirri have rather short clavate papillæ continued almost to the tip of the organ. The ventral cirrus has shorter cilia of a similar shape. The dorsal bristles are distinctly curved, and have somewhat wide and prominent rows of spines, so that in some positions the more slender forms resemble stems of the common *Equisetum*. The superior ventral series of bristles have capillary

* The genus is a new one lately formed for certain British species. The specific name is explained in the first paragraph of the paper.

tips of extreme delicacy; a few in the centre of the foot are stouter, while the shorter ventral forms have again a capillary termination. A parasitic *Loxosoma* occurs on the bristles.

Eupolynoë occidentalis, n. sp.

A fragment of the anterior end was procured in 110 fathoms between Cape Rosier and Cape Gaspé, so that only an imperfect description is at present attainable. It is a large form, with comparatively short feet and slender bristles.

The head is dull purplish, two eyes being placed at the posterior and outer part, and two larger in front on the lateral prominence. Tentacle absent; antennæ slender, subulate, and furnished with clavate papillæ. Palpi brownish, with minute though rather elongated papillæ. Tentacular cirri tapered, with numerous large clavate papillæ. A single dorsal cirrus only was found loose on the dorsum; it was filiform, gently tapered from the base to the point at which the more rapid narrowing of the tip occurs. The base is covered with a dense series of long papillæ, which exceed the diameter of the organ; they are shorter towards the tip. The long papillæ are remarkably slender, uniformly cylindrical, with a slightly bulbous tip. The ventral cirrus tapers from base to apex, and is nearly smooth; a few short papillæ, however, are visible in some. The ventral papilla is well marked and nearly cylindrical.

The dorsal bristles are rather small, not much tapered towards the tip, which is somewhat blunt and peculiarly curved (Pl. IX. fig. 8, one of the longer forms). The rows of spikes continue nearly to the tip. One of the stouter forms is given in fig. 9.

The ventral bristles are brownish rather than yellow, and are grouped in three series. The upper are rather slender, have elongated, tapered, spinous tips, which terminate in a slender fork, a modification of the normal structure (Pl. IX. fig. 10). Some have the fork even more slender and elongated than represented in the figure; others, again, have a shorter and stouter fork (Pl. IX. fig. 11). The next series have shorter tips and somewhat stouter shafts, the tips generally being evidently bifid (Plate IX. fig. 12). The latter represents an average example, some having a more elongated, others a shorter and less distinct fork. The inferior series, again (fig. 13), all have stout shafts and simple tips, the curves of these and their general contour showing progressive changes from series to series. This and the next approach the *Lepidasthenia elegans* of Grube from the Mediterranean.

Eupolynoë anticostiensis, n. sp.

Dredged rather abundantly in various parts of the Gulf of St. Lawrence in 1873. Distinguished under the naked eye by the somewhat elongated and flattened cylindrical body, covered with curiously mottled brownish scales with a distinct median spot.

Head with two eyes situated near the posterior border, and two under the outer margin of the somewhat pointed anterior lobes, so that they are not seen from the dorsum. The tentacle has a filiform tip, and the tentacular and dorsal cirri are furnished with rather short but very characteristic clavate papillæ. The palpi likewise terminate in a filiform tip, and have minute papillæ sparsely distributed. The ventral cirri are short, scarcely reaching the base of the bristles, and with a few short clavate papillæ. The tips of the dorsal cirri also scarcely reach the tips of the bristles. The caudal styles are somewhat short.

There are fifteen pairs of scales, covering the body completely from head to tail; they are small in front, and increase in size posteriorly, the last pair being the largest as well as the most ovoid. From the brownish spot in the centre a curved brownish band, minutely speckled, proceeds inwards, sweeps round the posterior border, and terminates at the outer edge. This gives the dorsum of the perfect animal the characteristic appearance formerly noted. They are nearly smooth, with the exception of a few short papillæ on the surface.

The dorsal branch of the foot has finely tapered and boldly serrated bristles, somewhat like those in *Nychia* (Pl. X. fig. 1). Some shorter forms occur next the body (Pl. X. fig. 2). The ventral division has superiorly a group with extremely elongated tips, some of which, however, are minutely forked if careful investigation is made (Pl. X. fig. 3). The tips gradually diminish in length and increase in stoutness, the bifid end having a broad and rather blunt terminal hook and a well-marked secondary process inferiorly (Pl. X. fig. 4).

There are considerable differences between this and the former species; but in the present state of the Annelida complication in names is to be avoided.

Nemidia (?) *canadensis*, n. sp.

Body somewhat elongated, consisting of about forty-eight segments exclusive of head and tail. The head has four eyes, which hold a somewhat median position—that is, leave a considerable space in front and behind the pairs. The anterior pair, as usual, are larger. The palpi are smooth; tentacle and

cirri short, the latter having small and sparsely distributed papillæ. The dorsal cirri do not quite reach the tip of the bristles, while the ventral do not extend beyond the base of the lowest bristles. A conspicuous row of brownish papillæ runs along the centre of the dorsum.

The scales are small, occupying only the lateral region of the body, and leave seventeen segments uncovered posteriorly. Their number seems to be fifteen pairs; but in none were they complete. They are more or less circular throughout, and have only a very few short papillæ on the posterior and outer edge.

The dorsal branch of the foot bears a series of rather short slender translucent bristles, very finely serrated (Pl. X. fig. 5). The superior series of the ventral group have elongated tips terminating in a fine point (Pl. X. fig. 6). The spiniferous rows are elevated on scale-like processes, as in certain forms described in the 'Porcupine' collection, with the free edges finely pectinated. The shaft of these bristles is quite smooth, while the dilated terminal portion is marked by fine longitudinal lines. The foregoing are succeeded by a stouter series with shorter tips (Pl. X. figs. 7 & 8), with only five or six conspicuous rows of spines, while the tip ends in a stout slightly hooked point. The first of the series has a more slender point, and with the others distinguish the species from Mahngren's *N. Torelli*. At the extreme ventral edge, again, a few slender bristles with finely tapered tips occur.

Nemidia (?) *Lawrencii*, n. sp.

In this form the scales are tolerably large and cover the back entirely, except anteriorly in the region of the fourth and fifth pairs. The segments number about 38.

The head is elongated from before backwards, and the pointed anterior lobes diverge in a characteristic manner. The eyes are small—a pair situated near the posterior border, and a larger pair on the lateral region in front of the middle line. Tentacle somewhat slender. Palpi furnished with distinct clavate papillæ. Tentacular and dorsal cirri with short clavate papillæ. The short and tapering dorsal cirri scarcely reach the tip of the bristles. The ventral cirri seem to be smooth.

The scales are somewhat ovoid, and nearly reach the posterior extremity of the animal, which has two long tapering caudal styles. They are almost smooth, a very few minute papillæ only occurring at wide intervals. Their number appears to be about fifteen pairs. Four bristled segments

exist between the posterior border of the last scale and the tail.

The superior branch of the foot has a series of pellucid bristles, somewhat stouter on the whole than in *N. canadensis*, and with bolder characters (Pl. X. fig. 9). They are finely serrated towards the tip, a feature which attains much more development in the shorter and stouter forms than in *N. canadensis*. The superior ventral bristles have long tips with somewhat less prominent rows than in *N. canadensis*; and the end is less capillary, though it is finely pointed (Pl. X. fig. 10). The larger size of the bristles also in the specimens brings out the smooth portion at the tip more distinctly. The tips in the succeeding forms are stout and sharply pointed, and the spined portion shorter and less prominent (Pl. X. fig. 11). The sabre-shaped tips of the latter are prominent features. This and the foregoing agree in certain respects both with *Enipo* and *Nemidia*, Malmgren. In regard to length of body they approach the latter, which, however, he describes as eyeless. The dorsal cirri, again, in *Enipo* are smooth. In British specimens which I have referred to the latter there are a few peculiarly bifid bristles besides the forms mentioned by Malmgren in the ventral group. In the foregoing Canadian examples the tips of all the bristles are simple.

Polynoë gaspéensis, n. sp.

Dredged in 100 to 212 fathoms off Anticosti and in various parts in 1872. A long and highly characteristic form, with fifteen pairs of smooth scales, the first pair only touching each other in the median line, the others being separated by a considerable bare portion of the dorsum; they are translucent, and slightly tinged of a brownish colour in spirit towards the inner border. The first pair are larger, and have their pigment more diffused though not more dense. In shape the first pair are ovoid; and the rest maintain a similar outline, but gradually diminish in size. The fifteen scales occupy thirty-one bristled segments, the last occurring on the thirty-first. In a large specimen there are thirty-seven segments behind the last scale, each bearing a dorsal cirrus as in the case of those in front without scales.

The head is furnished with two eyes placed some distance in front of the posterior border, and two (as usual, somewhat larger and wider apart) at the anterior border. Tentacle long, brownish, the colour being deepest just below the tapering tip, which is pale; a very few slender papillæ occur on this organ. Palpi also brownish, with pale tips, densely covered with short clavate papillæ. Antennæ short, brownish, with pale

tapering tips, sparsely furnished with short clavate papillæ. The tentacular and dorsal cirri have similar clavate processes; and the latter extend rather beyond the extremity of the bristles. The ventral cirri have also a few small clavate papillæ. The papilla at the inner end of the foot is somewhat elongated.

The feet are well marked, though somewhat thick and short. The bristles of the dorsal tuft are short (Pl. IX. figs. 14 & 15). The ventral series consist of one kind, with a stout shaft and a simple tip (Pl. X. figs. 12 & 13). There are comparatively few rows of spikes. The former figure is from the middle of the group, the latter from the superior border. The spine at the base of the smooth tip is well marked in the last mentioned.

The family of the Accetidæ has no representative; but four examples of the next, the Sigalionidæ, occur. The first is *Sthenelais limicola*, Ehlers, a northern species having a very wide distribution. The second is *Leanira tetragona*, CErst., which was met with in 1872 off Cape Rosier in 110 fathoms on coarse sand and stones, and in 110 to 221 fathoms between Anticosti and the Gaspé peninsula in 1873. The form is distinguished by its *Sigalion*-like appearance; but the bristles of the feet have simple tapering tips. The antennæ are represented by short processes at the side of the tentacle; and no eyes are visible in spirit-preparations. The scales are pellucid, reniform, and furnished with rather long and nearly cylindrical papillæ, the tips of some of which are obscurely bifid; the rest of the margin is smooth. The superior lobe of the foot bears long bristles with wide rows of spikes, while the basal portion is smooth. A group of long papillæ project from the upper margin of the foot, and occasionally a few are obscurely bifid. Similar organs occur on the inferior lobe. The whole of the bristles of the latter have tapering filiform tips, with apparently a spiral series of markings. The shafts and tips of the superior ventral series are, as usual, stouter than the inferior; but the diminution is not quite uniform, as a strong group occurs just above the most delicate ventral series. The ventral cirrus is well developed, but does not quite reach the tip of the foot. There are three ciliated pads on the dorsal edge below the branchial process. Another *Leanira*, apparently differing from any yet described, though allied to *L. Yhleni*, Mgrn., was procured in 1873 in 210 fathoms off the S.W. point of Anticosti. None of the examples are complete; but it seems to attain a length of 2 or 3 inches.

The head is at once distinguished from *L. levis* of the 'Por-

cupine' expedition (a species also having smooth scales) by the condition of the median tentacle, which with the other parts conform to the arrangement in *L. tetragona*. The scales are delicate, translucent, irregularly rounded in front, reniform posteriorly, and perfectly smooth round the margin. The dorsal bristles have, perhaps, more closely arranged rows of spikes than in *L. levis*. The inferior bristles (Pl. X. fig. 14) have delicately tapered tips, with faint spiral indications internally. The latter differ, of course, according to the position in which they are viewed. The ventral cirrus is considerably longer than in *L. tetragona* or *L. levis*; and the digitate appendages of the lobes of the feet also differ from both. Dr. Mahngren states that his *L. Yhleni* has distinct eyes, and adds that (with the exception of the smooth scales) it agrees with *L. tetragona*. His notice is so very brief that it is impossible to distinguish forms so closely related to each other. The fourth species of the group is the common *Pholoë minuta*, Fabr., which has a wide range.

Several remarks on the Annelida of the neighbouring shores of the United States have been made. Amongst others Dr. Stimpson, in his 'Synopsis of the Fauna of Grand Manan in the Bay of Fundy,' mentions *Euphrosyne borealis*, CErst., *Cryptonota citrina*, n. sp., *Lepidonota cirrata*, CErst., *L. punctata*, CErst., and *L. scabra*, CErst. The second is probably a *Spinther*; the next two are doubtful; and the third is *Nychia cirrosa*, Pallas. Dr. Leidy*, again, considers *L. punctata* of the former author to be another species, which he terms *L. armadillo*, Bosc; it has dilated cirri, with a black ring, but differs from *L. clava*, Mont., in having cilia on its scales. He also states that *Sigalion mathilde*, Aud. & Edw., is found on these shores; but the figure of the head given (fig. 53, pl. xi.) shows the prominent median tentacle of a *Sthenelais*; so that some other form is meant. In his recent paper Prof. Verrill indicates "*Hermione hystrix*(?)" as formerly noted, and "*Antinoë Sarsi*," Kbg.

EXPLANATION OF THE PLATES†.

PLATE IX.

Fig. 1. Terminal portion of a dorsal bristle of *Lagisca varispina*, var. *occidentalis*. × 210 diam.

Fig. 2. Superior ventral bristle of the same species. × 90 diam.

* Contrib. &c. Marine Invert. Fauna of Rhode Island, 1855.

† Unfortunately the details in certain of the figures deviate from the originals.

- Fig. 3. Inferior ventral bristle. $\times 90$ diam.
 Fig. 4. Developing bristle of the same form. $\times 210$ diam.
 Fig. 5. Dorsal bristle of *Malmgrenia Whiteavesii*. $\times 700$ diam.
 Fig. 6. Superior ventral bristle. $\times 700$ diam.
 Fig. 7. Inferior ventral bristle in chloride of calcium. $\times 700$ diam.
 Fig. 8. One of the longer dorsal bristles of *Eupolynoë occidentalis*. $\times 350$ diam.
 Fig. 9. One of the shorter dorsal bristles. $\times 350$ diam.
 Fig. 10. Superior ventral bristle of the same species. $\times 350$ diam.
 Fig. 11. Tip of another example. $\times 700$ diam.
 Fig. 12. Tip of one of the next series. $\times 350$ diam.
 Fig. 13. Tip of one of the inferior ventral bristles. $\times 350$ diam.
 Fig. 14. Dorsal bristle of *Polynoë gaspéensis*. $\times 350$ diam.
 Fig. 15. Tip of another, showing the blunt termination. $\times 350$ diam.

PLATE X.

- Fig. 1. Dorsal bristle of *Eupolynoë anticostiensis*. $\times 210$ diam.
 Fig. 2. One of the shorter forms. $\times 210$ diam.
 Fig. 3. Superior ventral bristle. $\times 210$ diam.
 Fig. 4. Inferior ventral bristle. $\times 210$ diam.
 Fig. 5. Dorsal bristle of *Nemidia* (?) *canadensis*. $\times 350$ diam.
 Fig. 6. Superior ventral bristle. $\times 350$ diam.
 Fig. 7. Tip of inferior ventral bristle. $\times 350$ diam.
 Fig. 8. One of the same seen from behind. $\times 350$ diam.
 Fig. 9. Dorsal bristle of *Nemidia* (?) *Laurencii*. $\times 350$ diam.
 Fig. 10. Superior ventral bristle. $\times 350$ diam.
 Fig. 11. One of the lower ventral bristles. $\times 350$ diam.
 Fig. 12. Ventral bristle of *Polynoë gaspéensis*. $\times 350$ diam.
 Fig. 13. Tip of another, with slightly different characters. $\times 350$ diam.
 Fig. 14. Ventral bristle of *Leanira Yhleni* (?). $\times 350$ diam.

XXXV.—On the *Geodephagous Coleoptera* of New Zealand.

By H. W. BATES, F.L.S.

[Concluded from p. 246.]

Family Carabidæ.

Subfamily ANISODACTYLINÆ.

TRIPLOSARUS, nov. gen.

Corpus breviter oblongum, subdepressum. *Caput* pone oculos haud angustatum. *Mandibulæ* edentatæ, basi latæ, apice angustatæ et curvatæ. *Labrum* medio leviter emarginatum, angulis rotundatis. *Mentum* medio dente forti, acuto; lobis extus valde rotundatis, apice intus acutis; epilobiis haud conspicuis. *Ligula* oblonga, apice libera, recte truncata; paraglossis apice æque truncatis, longitudine et latitudine ligulæ æqualibus. *Thorax* transversim quadratus. *Elytra* apice obtuse rotundata, paulo sinuata; striola